

### **REMARKS**

Claims 1-16 and 19-20 are all the claims presently pending in the application. Claims 1, 3-6, 11-14 and 20 have been amended to more particularly define the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

**Claims 1-16 and 19-21** stand rejected under 35 U.S.C. 101 as being allegedly directed to nonpatentable subject matter.

**Claims 1, 13, 14 and 20** stand rejected under 35 U.S.C. 112, second paragraph as being allegedly indefinite.

**Claims 1-2, 6-7, and 11-13** stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ausubel (U.S. Patent No. 5,905,975).

**Claims 3-5** stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ausubel, and further in view of McAfee, et al. (U.S. Patent No. 6,718,312 B1) (hereinafter “McAfee”).

**Claims 8-10** stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ausubel in view of Macready, et al. (U.S. Publication No. 2002/0016759) (hereinafter “Macready”).

These rejections are respectfully traversed in view of the following discussion.

#### **I. THE CLAIMED INVENTION**

An exemplary aspect of the claimed invention (e.g., as recited in claim 1) is directed to a computer implemented method for an auction, including establishing an auction system which is accessible via a network and includes a processor which generates a user interface for entering a bid, and entering in the auction system a bid for an item, the bid being entered by a bidder by using the user interface to identify an item, a bid value for the item and a constraint for a set of items including the item.

Importantly, the method also includes formulating a winner determination problem including the constraint as an integer program, solving the integer program to determine whether the bid is a selected bid, and updating the user interface based on whether the bid is determined to be a selected bid (Application at Figure 3A; paragraphs [0037]-[0059]).

As explained beginning at line 11 on page 3 of the specification, conventional methods do not enable auction participants to specify constraints that describe or characterize a combination of items they wish to win or sell. Nor do conventional methods formulate a winner determination problem including a constraint as an integer program and solve the integer program to determine whether a bid is a selected bid

The claimed invention, on the other hand, formulates a winner determination problem including the constraint as an integer program, solving the integer program to determine whether the bid is a selected bid, and updating the user interface based on whether the bid is determined to be a selected bid. That is, the claimed invention may allow the "winner determination problem" to be formulated as an integer program (e.g., including the constraints specified by a participant in the auction) which can be solved by commercially available software packages (Application at page 1, lines 5-7).

## **II. THE 35 USC 101 REJECTION**

The Examiner alleges that claims 1-16 and 19-21 are directed to nonstatutory subject matter. Applicant submits, however, that these claims are clearly directed to statutory subject matter.

Applicant notes that claims 1, 13, 14 and 20 have been amended based on the Examiner's helpful comments. In particular, claim 1 has been amended to recite establishing an auction system which is accessible via a network and comprises a processor which generates a user interface for entering a bid (e.g., see Application at [0072]).

In view of the foregoing, the Examiner is respectfully requested to withdraw this rejection.

### III. THE 35 USC 112, SECOND PARAGRAPH REJECTION

The Examiner alleges that claims 1, 13, 14 and 20 are indefinite. Applicant submits, however, that these claims are clear and not indefinite.

In particular, the Examiner alleges that the terms "column generation formulation", "column generation technique", "characterizes" and "based on".

Applicant submits that even assuming (arguendo) that the Application does not explicitly define the term "column generation", "constraint" or "integer program", such an explicit definition is clearly not necessary for the claims to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, because the terms "column generation", "constraint" and "integer program" are well known to **one skilled in the art of mathematical optimization**,

Indeed, on August 14, 2008, Applicant performed a search on www.google.com by entering the keyword "column generation", and dozens of article were returned which describe various column generation methods in great detail. Submitted herewith is an IDS which includes two of the articles which were returned by the keyword search.

Further, attached hereto as Exhibit 1 is one of the articles (i.e., Ulrich Junker et al., "A framework for Constraint Programming Based Column Generation") returned by the keyword search. The article states the following on pages 1-2 of the article:

*"The column generation method, also known as Dantzig-Wolfe decomposition, is a powerful method for solving large-scale linear and integer programming problems"...*

*Column generation is a method to avoid considering all variables of a problem explicitly...*

*Column generation has been applied to a large number of problems. The first application consisted of specially structured linear programs... More recent applications include specially structured integer programs such as the generalized assignment problem and time constrained vehicle routing, crew pairing, crew assignment and related problems".*

Further, Applicant notes that the Application states that:

*"The representation of a combinatorial auction as an integer program is known. However, the inclusion of participant-specified constraints in the auctions, whether combinatorial or non-combinatorial, and the formulation of the winner determination problem with participant-specific constraints as an integer programming problem is a novel aspect of this invention" (Application at [0066]).*

Indeed, on August 14, 2008, Applicant performed a search on www.google.com by entering the keyword "integer program" and auction, and dozens of article were returned which describe various methods of using integer programming to "solve an auction" in great detail. Submitted herewith is an IDS which includes one of the articles which was returned by the keyword search.

Therefore, **one skilled in the art of mathematical optimization** would instantly understand what is intended by the limitation "*generating a proposal **based on the constraints** specified by the participant using a column generation formulation, said proposal comprising a set of bids from the participant that satisfies all of the constraints specified by the participant*", and "*receiving constraints specified by a participant in the auction, wherein the constraints characterize combinations of items desired by the participant within said auction system*", as recited, for example, in claim 14.

In view of the foregoing, Applicant respectfully submits that claims 1, 13, 14 and 20 are clearly defined and not indefinite. Therefore, the Examiner is respectfully requested to withdraw this rejection.

#### **IV. THE ALLEGED PRIOR ART REFERENCES**

##### **A. Ausubel**

The Examiner alleges Ausubel makes obvious the invention of **claims 1-2, 6-7, and 11-13**. Applicant submits, however, that Ausubel does not teach or suggest each and every feature of the claimed invention.

In particular, Ausubel does not teach or suggest "*formulating a winner determination problem including said constraint as an integer program, solving said integer program to determine whether said bid is a selected bid, and updating said user interface based on whether said bid is determined to be a selected bid*", as recited in claim 1. As noted above, That is, the claimed invention may allow the "winner determination problem" to be formulated as an integer program (e.g., including the constraints specified by a participant in the auction) which can be solved by commercially available software packages (Application at page 1, lines 5-7).

Clearly this feature is not taught or suggested by Ausubel.

Indeed, the Examiner surprisingly states that "Ausubel discloses a method of formulating a winner determination problem with the constraint specified by the participant as an integer problem... Further, Audubel (sic) teaches the use (sic) formulation and processing of an auction process through the use of an integer approach (Fig's 3D-12B))" (Office Action at page 6).

Applicant respectfully submits that if by "integer approach" the Examiner means that Ausubel teaches integer program, the Examiner is clearly incorrect.

Indeed, Applicant notes that an "integer program" is a linear programming problem (e.g., a problem involving the optimization of a linear objective function, subject to linear equality and inequality constraints), in which some of the variables are required to be integers. That is, a linear programming problem determines the way to achieve the best outcome (such as maximum profit or lowest cost) given some list of requirements represented as linear equations.

Nowhere does Ausubel teach or suggest the features of the claimed invention. Indeed, Ausubel simply teaches listing a sequence of value pairs which include "an amount representing a number of shares of stock or other objects offered and a value parameter indicating the offered price for the number of objects" (Ausubel at col. 12, lines 39-44). When the users participating in the auction have entered bids, a register stores the total number of objects demanded by the bidders. The amount offered is then compared to the total number of objects demanded by the bidders (Ausubel at col. 12, lines 44-56).

Ausubel also teaches using a Vickrey auction to "determine which allocation of goods is associated with the highest total bids" (Ausubel at col. 14, lines 53-58).

That is, nowhere does Ausubel even teach or suggest linear programming. Ausubel certainly does not teach or suggest formulating a winner determination problem including the constraint as an integer program, solving the integer program to determine whether the bid is a selected bid, and updating the user interface based on whether the bid is determined to be a selected bid, as in the claimed invention (e.g., with respect to claim 15, nowhere does Ausubel teach or suggest "*wherein said integer program is expressed by the following:*

$$\text{Max} \quad \sum_{i,p} v_{i,p} x_{i,p}$$

*where  $v_{i,p}$  denotes a monetary value of a bid that bidder  $p$  has placed for item  $i$ , and,  $x_{i,p}$  denotes a decision variable having a value of 0 when said bid is not in a winning combination, and 1 when said bid is a winning combination").*

Therefore, Applicant submits that these alleged references would not have been combined and even if combined, the combination would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

#### **B. McAfee and Macready**

The Examiner alleges that Ausubel would have been combined with McAfee to form the invention of **claims 3, 4 and 5**, and with Macready to form the invention of **claims 8-10**. Applicant submits, however, that these alleged references would not have been combined and even if combined, the combination would not teach or suggest each and every feature of the claimed invention.

Indeed, Applicant submits that these alleged references are completely unrelated, and no person of ordinary skill in the art would have considered combining these disparate

references, absent impermissible hindsight.

In fact, Applicant submits that the alleged references provide no motivation or suggestion to urge the combination as alleged by the Examiner. Indeed, these alleged references clearly do not teach or suggest their combination. Therefore, Applicant respectfully submits that one of ordinary skill in the art would not have been so motivated to combine the alleged references as alleged by the Examiner. Therefore, the Examiner has failed to make a prima facie case of obviousness.

Moreover, neither Ausubel, nor McAfee, nor Macready, nor any alleged combination thereof teaches or suggests "*formulating a winner determination problem including said constraint as an integer program, solving said integer program to determine whether said bid is a selected bid, and updating said user interface based on whether said bid is determined to be a selected bid*", as recited in claim 1. As noted above, That is, the claimed invention may allow the "winner determination problem" to be formulated as an integer program (e.g., including the constraints specified by a participant in the auction) which can be solved by commercially available software packages (Application at page 1, lines 5-7).

Clearly, this feature is not taught or suggested by McAfee.

Indeed, McAfee simply teaches using bid composition restrictions in a "dynamic combinatorial auction". The restrictions include non-additive activity restrictions, subset restrictions and superset restrictions (McAfee at Abstract).

However, even assuming (arguendo) that McAfee teaches "constraints" as alleged by the Examiner, nowhere does McAfee teach or suggest formulating a winner determination problem including the constraint as an integer program, solving the integer program to determine whether the bid is a selected bid, and updating the user interface based on whether the bid is determined to be a selected bid.

Likewise, Macready does not teach or suggest this feature of the claimed invention. Indeed, Macready does not even teach or suggest an auction. Instead, Macready simply teaches a level of optimization which ranks trades with suppliers, allegedly allowing a buyer to determine the best alternative (Macready at [0002]).

That is, even assuming (arguendo) that Macready teaches "constraints", nowhere does

McAfee teach or suggest formulating a winner determination problem including the constraint as an integer program, solving the integer program to determine whether the bid is a selected bid, and updating the user interface based on whether the bid is determined to be a selected bid.

Therefore, neither McAfee nor Macready make up for the deficiencies of Ausubel.

Therefore, Applicant submits that these alleged references would not have been combined and even if combined, the combination would not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

## **V. FORMAL MATTERS AND CONCLUSION**

In view of the foregoing, Applicant submits that claims 1-16 and 19-20, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.


Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.



Serial No. 09/850,383  
Docket No. YOR920010417US1

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Respectfully Submitted,



Phillip E. Miller, Esq.  
Registration No. 46,060

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**McGinn IP Law Group, PLLC**  
8321 Old Courthouse Road, Suite 200  
Vienna, VA 22182-3817  
(703) 761-4100  
**Customer No. 48150**